

ENVIRONMENTAL MANAGEMENT SYSTEMS IN HUNGARY

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Abstract

After a short theoretical and historical introduction about the environmental management systems we show the status of the environmental management system implementation based on the requirement of ISO 14001 standards. We overview the Hungarian situation then write in details the research directing to assessment of the triad of system operation, clearer production and environmental demand. Based on the research results we define statements which prove the set up model and the hypothesis.

Keywords: environment, management, system, ISO 14001, technology cleanness.

1. Introduction

Nowadays, the environmental protection and the issues belonging to that come into the foreground both in the private and the economical areas. The judgement of the environmental protection by the society and the public approach of it underwent significant changes in the previous years. These changes have resulted in development of the environmental culture and increase of the importance of the environmental issues. The reason for it is that more and more people get to know what damages and, in some time, irreversible changes the human intervention causes in the living world of the Earth and in the global ecosystem.

Observing the harmful impact of the industrial production the companies and economical organizations are forced (and also because of the business interests) to build the environmental issues in their management. This is necessary because the environmental problems not only have an effect on the image and the market position but also touch upon the employees, the objects outside the company area (living areas, green zones, etc.), local authorities and the business relationships of the company (suppliers, customers).

This is the background why the ecological problem came into the foreground of the management of companies and the so-called '*ecological opening*' started which means the applying of the environmental aspects (as a result of the external forcing and pressure) in the management (KÓSI, 1997).

The real environmental activity of the companies is limited to the technical area and does not touch upon for instance controlling, marketing. Therefore, the

handling of the environmental risks that can be observed by an effective controlling system as well as discovering and utilization of the opportunities in the environmental marketing are often in the background in the course of the decision making processes.

There is a stressed importance of the EU 1836/1993. The regulation that makes the voluntary participation in the Eco-Management and Audit Scheme of the EU possible for the companies. The ISO 14001 standard which can be the basis of an environmental management system is also a significant tool especially because it helps the systematic assessment of the environmentally relevant energy and material streams, the discovering of saving possibilities, the implementation of integrated environment-technical solutions, etc. (KÓSI – VALKÓ, 1999).

The EMAS gives the possibility for the producer companies of the EU to implement an environmental management system. The international ISO 14001 standard that makes possible the system implementation and operation for each country was officially published in September of 1996. The introduction of the standard expresses the purpose that the ISO 14001 should be applied for any type and any size companies. The success of the system depends on the different functions and especially the management commitment. Such a system supports the organization to declare an environmental policy that fits to the current laws and regulations concerning to the environmental impacts.

The system implementation and operation contribute to creation of the procedures which realize the objectives, evaluation of the procedure efficiency and results in demonstrating the environmental orientation toward the external partners. The general purpose of the standard is to support the environmental protection and realization of the continuous improvement in line with the economical and social needs.

The further issues of the environmental management system implementation in addition to the environmental performance development may be the following:

- external considerations: improvement of the company image and goodwill, fulfillment of the requirements of internal and external partners (usually the external partners represent the ecological problem),
- internal considerations: systematic operation, holding the laws and regulations, assessment of the significant environmental impacts, evaluation of the earlier happened accidents and breakdowns, review of the current practices, increasing of the profitability, determining the responsibilities, environmental culture improvement, etc.

2. The Hungarian Situation

The publication of the ISO 14001 environmental management system standard it, has run a successful way in Hungary, too, as it can be seen in *Fig. 1* (WEISZ, 2000).

There are 116 certified companies in Hungary to date. *Fig. 1* represents the growing of the certification in the previous years.

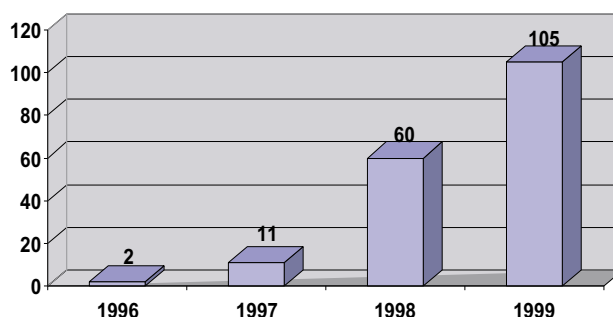


Fig. 1. ISO 14001 registration in Hungary

Based on the summary (ZILAHY, 2000) of a research *Table 1* contains the most important environmental management tools putting into the cell that shows the Hungarian situation.

Table 1. The application of EMS tools in Hungary

Aspects	Environmental management tools
Under implementation or operation at the most companies	<ul style="list-style-type: none"> • Environmental targets • Environmental Program • Environmental organization
There is an occasionally application at the most companies	<ul style="list-style-type: none"> • Communication with the public area
Not existing at 50 per cent of the companies	<ul style="list-style-type: none"> • Written Environmental Policy • Training for top managers • Training for employees • Environmental marketing • Environmental risk assessment • Internal environmental communication
Not existing at min. 70% of the companies	<ul style="list-style-type: none"> • EMS fulfilling the standard requirements • Supplier environmental evaluation

Only three tools are widely applied among the companies. Target setting is often used but in the practice it usually means only measuring the impact of the environmental actions. In the background of it is a material or energy flow monitoring at near 75 percentage of the companies. The Environmental Program exists very frequently only non-formally. Usually the environmental corrective actions give the basis for the Programs. The environmental organization means applying an environmental expert at the company in the most cases. Environmental

Department as an organizational structure is very unique.

In general the communication with the public and the social institutions is not a continuous but an occasional activity.

More than half of the companies have no written Environmental Policy. The training of people is also a weak point and the environmental marketing, environmental risk assessment and the internal communication should be improved, too.

The 116 certified environmental management systems relating to the Hungarian economy and the industrial sectors mean a very good performance of the country.

Table 2 summarizes the level of the environmental management in the different industries. Meaning of the levels:

- low: 0–3 elements operate/0–6 elements under implementation
- medium: 3–7 elements operate/many elements under implementation
- high: 7–13 elements operate

The elements come from the standard requirements.

Table 2. The level of environmental management in the different industrial sectors

Industrial sector	Distribution of companies		
	Low level	Medium level	High level
Food Industry	31	62	7
Furniture Industry	22	56	22
Textile Industry	83	17	0
Metallurgy	57	43	0
Manufacturing	46	39	15
Construction Industry	50	33	17
Chemical Industry	20	33	47

Fig. 2 shows the applied methods of the clean production by the Hungarian companies. The figure uses a 0 to 10 scale with 0 as ‘not applied’ and 10 as ‘widely and efficiently applied’ endpoints.

As it can be apparent, the listed methods are used on medium or lower level. Taking into consideration the environmental aspects that in the decision about investments is a crucial issue, but it is relevant only if the investment aims the negative environmental reduction directly. Waste selection is one of the most used methods in Hungary. The lower rate of the Recycling is an interesting result and shows that companies are probably not ready (technically) to recycle the waste. Therefore the reducing of the raw and production materials is a more important item. Replacement, process reengineering and waste trade are further middle-level methods. There is a small significance of Re-production, re-assembly, redesign and lifecycle lengthening.

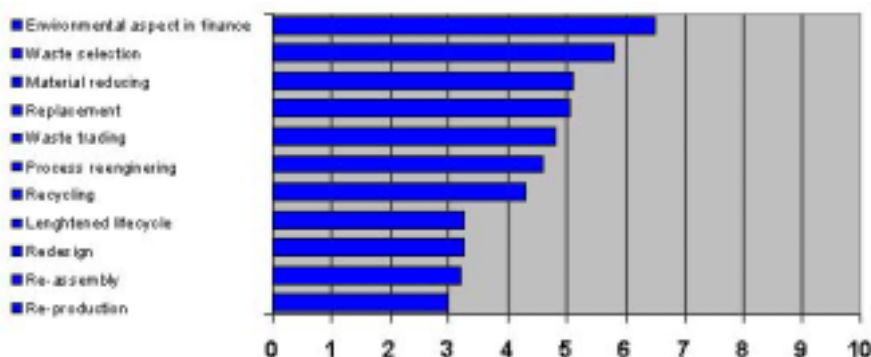


Fig. 2. The applied environmental methods

3. Survey on the Results and Impacts of the Environmental Management Systems Operation in Hungary

The integration of the environmental issues into the company operations and the society is a long way with many difficulties at every step. This process can be evaluated rationally only if real questions are taken into consideration: usually the basic questions of the companies concern on (1) the required investments and (2) the results that can be achieved. In the followings these questions will be dealt with.

This study covers on one hand the field of *environmental demand* which comes from the company conditions and on the other hand the field of *clean production* which represents the reached results in the practice. The topic will be discussed based on the information about the Hungarian small and medium enterprises because we believe that only the participants (the companies themselves) are able to judge the current situation. Hereby the basis of this chapter is a wide-range survey and the results of it will help to assess the relation of the environmental demand and the clean production both from theoretical and practical viewpoint. After the management decision about implementation of the clean production *the technology determines the results which can be achieved therefore we use the expression 'clean production' as a synonym of an environmental friendly characteristic of the technology.*

In the following we show the relationship between the environmental demand and the clean production. Our purpose is through the scientific evaluation of these relationships to discover the characteristics and regularities which can help the realization of the already mentioned task of environmental protection in practice. For the sake of it we discuss not only the general statements but also touch upon the industry-specific and company-specific (small, medium and large organizations) questions.

3.1. The basic Model

Each improvement requires resources so this topic cannot be left out of consideration. The basic improvement-efficiency principle is that the benefit resulted by the improvement should cover the costs of the invested resources. The environmental investments are also a kind of business investments even they have some special features. The main problem is that the benefit of these investments can be observed not just in the given company but can be evaluated only globally. This global benefit usually shows a positive balance but the share of the investor company might be so small that its balance becomes negative.

By this reason it is necessary to examine the regularities of the environmental demand from an other viewpoint. The environmental demand shows to what extent the given company is open toward the environmental-related activities, methods, tools. We can say that *the environmental demand is the measure of the environmental orientation of an organization*.

There is an obvious relationship between the clean technologies realizing the decreasing of the environmental impacts and the environmental demand because these two elements are principal for the movements toward environmental orientation (see Fig. 3).



Fig. 3. The 'Environmental demand – clean technology' wheel

The environmental demand gives the motivation to the environmental activity of the company. Without demand it is not possible to sustain a real and long-term improvement of the environmental performance. The demand will lead to the movement of the company toward application of clean technologies and reducing of the environmental impacts. As a result of it a higher level of the environmental culture will take place. This higher level culture certainly has an influence on the environmental demand because the integrating of the environmental approaches and principles into the everyday operation becomes a natural process strengthening the environmental orientation. The increasing of the environmental demand develops the cleanness of the technology again and hereby the wheel gets to a higher state in the slope of environmental culture.

3.2. Hypothesis of the Contact of Environmental Demand and the Clearer Production

Belonging to the written theoretical thoughts there are several questions. It seems to be evident that there is a correlation between the environmental demand and the cleanness of the technology. However, the nature of this relationship is not so evident since the linear correlation is not likely. This consideration can be rational because it is easy to achieve results among less environmentally oriented society and company circumstances. In the case of cleaner technologies the further improvement can be so difficult respect to the economical and technical barriers that much more investment (higher environmental demand) is necessary to the technology development.

An other question is how to define the level of environmental orientation or environmental culture. The model of Fig. 3 picks out the environmental demand and the cleanness of the technology as basic elements having a principal impact on the environmental culture therefore we will measure the culture level through the level of these two elements. The horizontal side of the slope of model should be a time-calibrated scale. By nowadays it became clear that (similarly to other management areas such as quality management) it is not possible to organize the environmental activities efficiently and effectively without a formalized structure, a *system*. We can say that the starting milestone of the 'environmental way' is when a company does not consider the environmental system implementation and the end of the way is when there is a system operating efficiently for a long term. Therefore our opinion is that efforts toward the system implementation and improvement reflect the progress better than a simple time-calibration scale. This supposition is also confirmed by an other survey (PATAKI-TÓTH, 1999).

Based on the above mentioned reasons Fig. 4 shows the hypothesis.

The figure has two graphs. One of them shows the line of environmental demand and the other one shows the line of technology cleanness level.

The horizontal bar of each graph shows the actual state of the system divided into five phases:

- 1 *Nothing happens* (the company does not think about environmental management system implementation)
- 2 *System planning* (there is a little movement toward the environmental management system implementation)
- 3 *System implementation* (there is the environmental management system implementation in process)
- 4 *System operation* (the operation of the built system)
- 5 *System improvement* (the stage of the implemented and probably an improved environmental management system)

There is a close relationship between the two graphs as it was already expressed at showing of the basic model.

In the lowest level of the environmental culture represented by the phase 1 there is a low-level environmental demand because the environmental protection

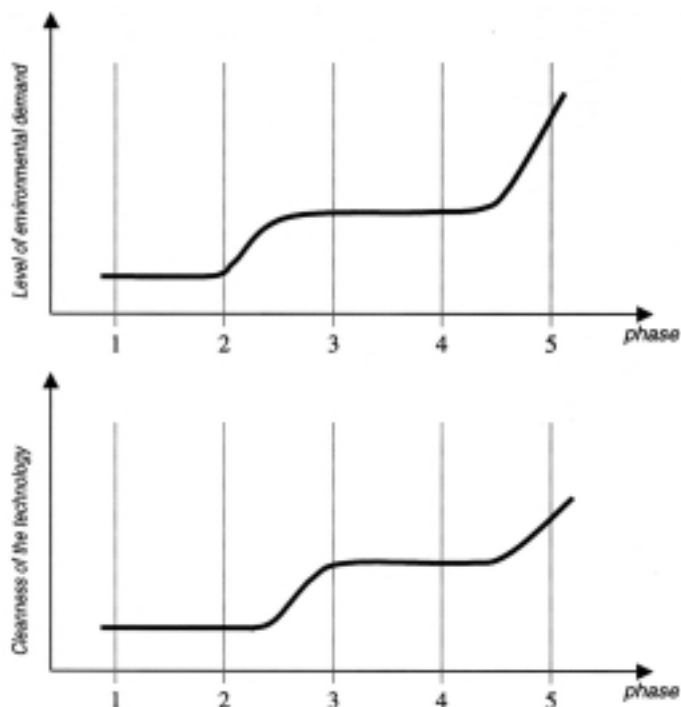


Fig. 4. Hypothesis on the trend of the environmental demand and the technology cleanness level

principles are not built into the company operation. This low-level demand is supposed not to guarantee the cleanness of the technology. When the need of the environmental management system arises we can speak about a higher level of the environmental demand but it is not enough to develop the cleanness of the technology. The phase 2 brings a breakthrough if the company decides about concrete actions. In this phase the environmental demand should be obligatorily on a higher level. After implementation of the environmental management system a new stable phase comes into exist where the basic purpose is generally to ensure the right operation of the system. There is not expected neither the demand change (the system is already implemented!) nor the technology level improvement. After a some year efficient and effective operation of the system the environmental culture becomes stable and the environmental issues are integrated into the employees' everyday work and mind. In these circumstances a new improvement phase can happen resulting in the achievement of a cleaner technology. It is important that it probably needs relatively higher environmental demand than in the previous phases.

We have organized a wide-range survey to prove the written hypothesis and the statements belonging to that (KÓSI-VALKÓ-GÁL-HÁRY, 2000). The survey focused basically on the Hungarian small- and medium producer enterprises. Some

non-producer and large-size companies were added to the target group in order to have control points and to state general conclusions.

3.3. The Survey Organized for Proving the Hypothesis

Our research is based on a questionnaire survey. In the course of the questionnaire planning the basic purpose was to create such questions which cover the topic of environmental demand and technology cleanness as well as give evaluable information proving or refusing the hypothesis.

We needed three kinds of information to the proper assessment of the hypothesis acceptability:

1. Basic Data

It is possible to judge based on this data which phase of the environmental culture the given company is in. As it was already mentioned this is evaluated basically through the affinity to the environmental management system. Some further information (size, products) are also gathered in order to make the assessment more detailed.

2. The Level of the Environmental Demand

Since the level of the environmental demand is a basic element of the survey assessment these topic-related answers are key-areas of the research.

3. Cleanness of the Technology

The other key area of the research is the assessment of the technology cleanness.

The latter two information groups (environmental demand and the technology cleanness) were examined from two points of view in order to get a more objective and realistic picture about the companies:

- direct evaluation of the current level,
- indirect evaluation of the current level,
- surveying of the future prospects.

In the course of the target group planning we striven for creating a representative sample through choosing the upper industrial sectors. We did not deal with the regional features. Taking into consideration the sectorial distribution we sent 321 questionnaires.

The evaluation of the questionnaires was carried out from the next aspects:

- the position of the company in the way of environmental culture;
- the level of environmental demand;
- the cleanness of the technology.

We developed a scoring system in order to evaluate the level of environmental demand and the technology cleanness objectively.

3.4. The Received Questionnaires and the Results

We got back 71 questionnaires which could be evaluated. Based on the database filled with results of survey the graphs could be drawn to prove our hypothesis. In the followings we evaluate the results through three graphs:

1. The level of the environmental demand in the different phases of the environmental oriented operation.
2. The level of the technology cleanness in the different phases of the environmental oriented operation.
3. The correlation between the demand level and the technology cleanness.

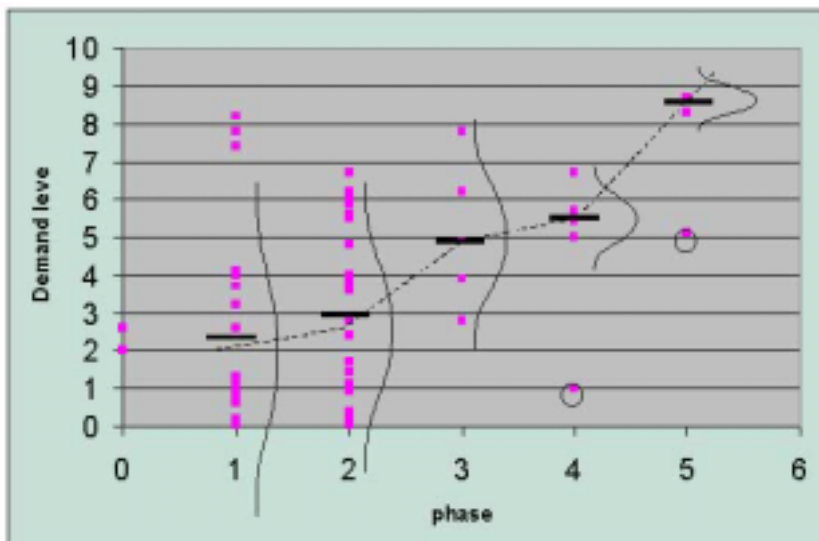


Fig. 5. The chart of the environmental demand level

For the sake of the visualization we use simple scatter charts at each three graph completing with additional statistical elements (distribution line, trend line, average line) as necessary.

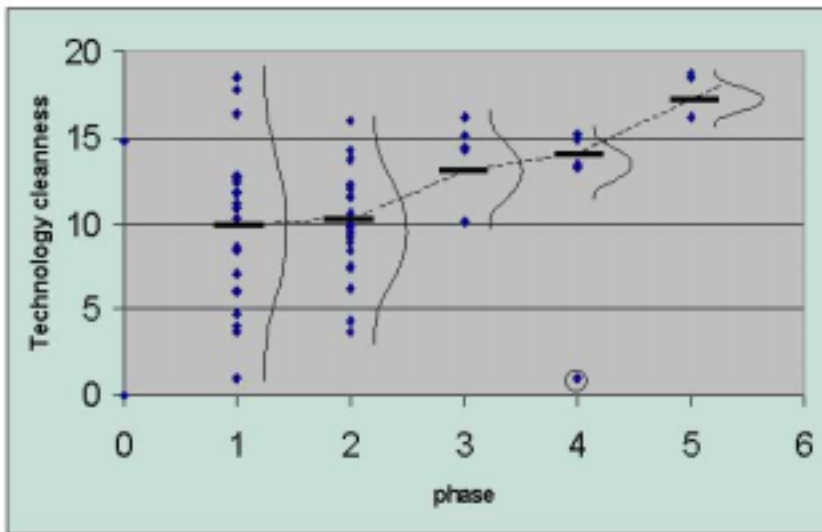


Fig. 6. The chart of the technology cleanness level

Based on the evaluation results (scores) the graphs can be drawn as it can be seen in Figs. 5, 6, 7.

As it can be seen on the graph the demand level seems to prove the hypothesis. It is also true in case of the graph of technology cleanness. In accordance of

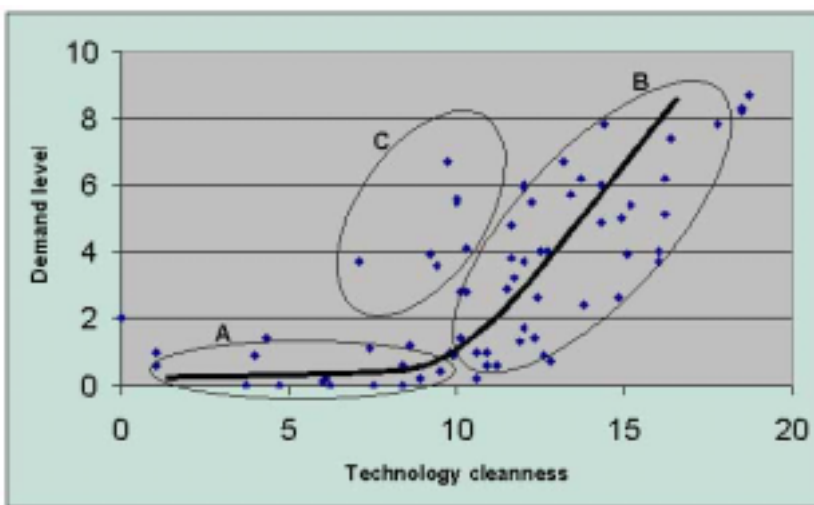


Fig. 7. The relationship between the environmental demand and the technology cleanness

the hypothesis the two graphs are very similar except some little but significant details. Our survey did not manage in confirming the ‘technology-slip’ of Fig. 1 so the phenomena that changing of the environmental demand does not result in immediately the change of the technology cleanness. The reason for that is that we used only five phases or the evaluation was not proper.

In the low level of the environmental culture (phase 1) the environmental demand is also on a low level. A definite technological cleanness belongs to that level. The survey shows that only the consideration of the environmental management system (phase 2) means neither the environmental demand increase nor the technology cleanness improvement. Based on the results the same or slightly lower demand is still enough to sustain this level of the technological cleanness. Phase 3 brings a breakthrough when the environmental management system implementation starts and happens. In this phase both the environmental demand and the technology cleanness are on a higher level. Phase 4 is the stage of the system operating and maintenance without any remarkable change. Phases 3 and 4 represent a qualitative change compared with phases 1 and 2. Further improvement can be realized if the company owns the environmental management system for several years and operates it efficiently and effectively (phase 5). This phase indices well the established and high level of the environmental protection therefore there is such an environmental infrastructure that is necessary to the further improvement of the technology cleanness. Let us take into account that the same degree technology cleanness increase requires more demand increasing on a higher level than on the lower levels. This phenomena will be discussed later.

It also can be observed that parallel to the movement toward the environmental orientation the companies behaviour becomes more and more predictable (see that the distribution lines are narrower). The statistical scatter is higher among the companies which do not plan the implementation of the environmental management system (phase 1) than those which have a stable and well-operating system (phase 5). As moving from phase 1 to phase 5 it can be predicted more and more surely that the demand and the technology cleanness level will be around the level stated in the hypothesis. This observation can be summarized: *the improvement of the environmental orientation and culture makes the behavior of the companies predictable on macroeconomic level.*

The scatter graph of Fig. 3 proves the hypothesis on the relationship between the environmental demand and the technology cleanness. The points are divided into three groups.

Group **A** shows the companies which have a low-level environmental demand and the demand indicates a constant or slightly increasing trend.

Group **B** shows a significantly different picture. The trend of it means that on higher level of the technology cleanness more significant degree demand increasing is necessary to achieve the same unit technology improvement than on lower technology cleanness levels.

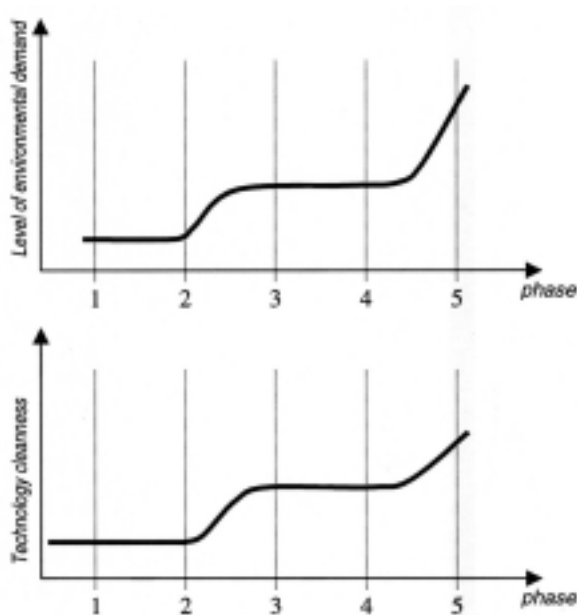
Group **C** is an exception. These points represent a situation where the trend of group **B** is moved to a lower level of the technology cleanness. It means that these companies have lower level cleanness than companies of group **A** even if the

environmental demand is the same.

Summarizing the information about the correlation graph it can be stated that *there is a nonlinear, progressive correlation between the environmental demand and the technology cleanness* resulting in the already discussed characteristics.

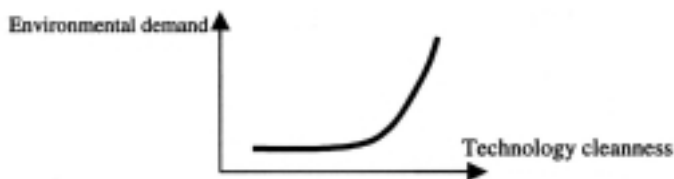
3.5. Conclusions

1. The following graphs put down the trends of the environmental demand level and the technology cleanness:



2. The improvement of the environmental orientation and culture (through the improvement of the environmental management system) makes the behavior of the companies predictable on macroeconomic level.

3. The relationship between the environmental demand and the technology cleanness is:



Some notes to the above stated conclusions:

- Industrial features

- The conclusions are valid in any sectors with some notes.
- In the food industry and in the construction industry the companies which considered the environmental management system implementation have a relatively high level technology cleanness.
- In general servicing companies have less clear technologies but this topic can be assessed in this sector not properly.
- In the chemical industries the companies which do not plan to implement the environmental management system represent higher level of both the environmental demand and the technological cleanness. This fact is also confirmed by an other concerning research (KEREKES–BARANYI–CSUTORA–KOVÁCS–NEMCSICSNÉ–ZILAHY, 2000).

- Company Size-Related Features

- The conclusions are valid for any size companies with some notes.
- In case of the small enterprises the environmental management system implementation usually happens because of an external force and is not the part of the process of environmental culture development.
- In case of small enterprises the cleaner technology is not the result of higher environmental demand.
- In case of small and medium size enterprises the relationship between the environmental demand and the technology cleanness shows linear correlation.

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